

IN THE CLAIMS:

1. (Currently Amended) A separating device for removing objects from an object stream, the device comprising a two dimensional array of individually actuable air jet nozzles, a two dimensional group of said nozzles being selectably actuated to remove a said object from the object stream-, the device further comprising a controller responsive to object data identifying objects in said object stream to selectably actuate said two dimensional group of nozzles corresponding to an object outline contained in said object data.
2. (Cancelled)
3. (Previously presented) A device as claimed in Claim 1, further comprising a conveyor arranged to receive said object stream, the conveyor being permeable to a gas jet emitted by said array, the array being positioned such that said conveyor is interposed between said array and said object stream.
4. (Original) A device as claimed in Claim 3, wherein said conveyor comprises a meshed belt.
5. (Original) A device as claimed in Claim 3, wherein said conveyor comprises a set of rollers.
6. (Cancelled)
7. (Previously presented) A device as claimed in Claim 1, wherein the nozzles are arranged in a substantially rectangular array of n rows by m columns.
8. (Previously presented) A device as claimed in Claim 1, wherein a plurality of nozzles are connected to a manifold.

9. (Previously presented) A device as claimed in Claim 1, wherein the nozzles are connected to a compressed air supply.

10. (Original) A device as claimed in Claim 2, wherein the controller is operable in response to data identifying an object in said stream to actuate nozzles in at least two columns.

11. (Currently amended) Sorting apparatus comprising

- (a) conveying means for conveying input objects input to the apparatus;
- (b) extracting means for extracting from the conveying means input objects identified as belonging to a particular object-class and removing said identified input objects to a remote location; and
- (c) processing means arranged to
 - (i) receive input data corresponding at least to the positions across the conveying means of said identified input objects; and
 - (ii) output control signals corresponding to the input data to the extraction means at an appropriate time to effect extraction of said identified input objects;wherein the extraction means comprises an array of nozzles, extending in a direction (z) across the conveying means, each of which is independently operable under control of the processing means to produce an air jet in a generally upward direction (y), and is arranged to activate ~~sub~~ groups of nozzles corresponding to, and in response to, said control signals; ~~characterised in that~~ wherein
- (d) the conveying means has a partially-open surface arranged to convey input objects over the array of nozzles;
- (e) the array of nozzles is two-dimensional and also extends in a direction (x) substantially parallel to the direction of motion of the conveying means when the apparatus is in use; and
- (f) the input data further corresponds to the outline shapes of said identified input objects; and.

(g) wherein the extraction means is arranged to selectably activate a two-dimensional group of nozzles corresponding to said outline shape.

12. (Previously presented) Apparatus according to claim 11 wherein the extraction means comprises two or more two-dimensional arrays of nozzles, the conveying means being arranged to convey input objects over the two or more arrays and each array being arranged to extract from the conveying means input objects belonging to at least one of a plurality of object-classes in response to control signals from the processing means.

13. (Currently amended) Apparatus according to claim 11 wherein the extraction means comprises a further two-dimensional array of nozzles so that there are first and second two-dimensional arrays of nozzles and the apparatus comprises a further conveying means so that there are first and second conveying means having partially open surfaces arranged to convey input objects over the first and second arrays respectively, each array being arranged to extract from corresponding conveying means input objects belonging to at least one of a plurality of object-classes in response to control signals from the processing means.

14. (Currently amended) Apparatus according to claim 11 further comprising means ~~(14; 54)~~ arranged to identify input objects composed of a particular material and to pass corresponding data to the processing means.

15. (Currently amended) Apparatus according to claim 14 wherein said means arranged to identify input objects is also arranged to establish the positions of identified input objects across the conveying means and to pass corresponding data to the processing means.

16. (Original) Apparatus according to Claim 15, wherein said corresponding data comprises a timestamp.

17. (Currently amended) Apparatus according to claim 15 wherein said means arranged to identify input objects is also arranged to establish the outline shapes of identified input objects and to pass corresponding data to the processing means.

18. (Currently amended) Apparatus according to claim 17 wherein said means arranged to identify input objects comprises an imaging sensor.

19. (Currently amended) Apparatus according to claim 11 and further comprising one or more tracking cameras arranged to track the position of input objects on the conveying means between the position at which the input objects are input to the apparatus and the position of the array of nozzles, and to provide corresponding data to the processing means.

20. (Original) Apparatus according to claim 11 wherein the conveying means is a meshed conveyor belt.

21. (Original) Apparatus according to claim 20 wherein the meshed conveyor belt has a meshed conveying surface with an open area fraction of at least 60%.

22. (Original) Apparatus according to claim 21 wherein the meshed conveying surface is made from one of plastic, metal and PTFE-coated fibre-glass.

23. (Previously presented) Apparatus according to claim 11 wherein nozzles in the array are arranged in rows having a nozzle pitch A, the pitch of the rows in a direction substantially perpendicular to the rows is A, and adjacent rows are offset in said direction by a distance $A/2$.

24. (Original) Apparatus according to claim 23 wherein $1\text{ cm} \leq A \leq 2\text{ cm}$.

25. (Previously presented) Apparatus according to claim 11 wherein each nozzle has an independent supply of pressurised air.

26. (Previously presented) Apparatus according to claim 11 wherein subgroups of nozzles are connected to respective manifolds each of which has an independent supply of pressurised air.

27. (Original) Apparatus according to claim 11 wherein each nozzle incorporates a valve and a solenoid arranged to open and close the valve in response to control signals.

28. (Original) Apparatus according to claim 11 wherein the extracting means may be adjusted to vary one or more of the speed, direction and duration of the air jets produced by the array of nozzles in response to control signals from the processing means.

29. (Withdrawn) A method of sorting objects, the method comprising the steps of

- (a) conveying a[[n]] stream of input objects on conveying means;
- (b) identifying objects in the input stream which belong to a particular object-class;
- (c) determining the positions across the conveying means of objects identified in

step (b); and

(d) using a separating device according to claim 1 comprising a two-dimensional array of individually actuatable air jet nozzles to apply applying-upwardly-directed air-jets to an identified object at an appropriate time, and at an appropriate position in a direction across the conveying means, to remove the identified object to a location corresponding to the object-class;

~~characterised in that wherein~~ the method further comprises the steps of

- (d) determining the outline shapes of said identified objects;
- (e) applying upwardly-directed air jets to the identified object, at the time and position specified in step (d), over an area of the object corresponding to its outline shape by selectably actuating a two-dimensional group of nozzles corresponding to said outline shape.